

REMARKS

This amendment under 37 CFR § 1.111 is submitted in response to the outstanding Official Action mailed May 5, 2005. In view of the above claim amendments and the following remarks, reconsideration and allowance of this application is respectfully respected.

Claims 1, 4, 27, and 30 have been amended to more particularly point out and distinctly claim the invention. Claims 1 and 27 have amended to recite a lithium compound anode instead of a lithium or lithium compound anode. This amendment does not introduce new matter because a lithium compound anode was disclosed in the originally-filed claims. Claims 1 and 27 have also been amended to recite that the lithium borate is a lithium borate hydrate, an aqueous lithium borate solution, or an aqueous lithium borate hydrate solution. Support for this amendment is found at, for example, page 8, lines 1-5 where "lithium borate" is defined to include the hydrate form; at page 3, lines 36-37, which discloses the aqueous treatment technique with lithium borate; and at page 4, lines 2-10, which discloses the dry-mix technique with lithium borate. Claims 4 and 30 have been amended to recite the lithium borate hydrate, which also does not introduce new matter.

Claims 1, 3-5, 7-13, 27, and 29-38 are rejected under 35 U.S.C. § 112, first paragraph, allegedly because the specification, while being enabling for a heating temperature in the range of 250°C to 450°C for an aqueous treatment, does not reasonably provide enablement for a heating temperature in the range of 250°C to 450°C for a dry treatment. However, support for this limitation is found at, for example, page 4, lines 2-5, which states, "a small amount of lithium borate and a transition metal oxide cathode are dry mixed thoroughly in a jar mill with media, then heated at a relative low temperature of greater than or equal to 250°C, but less than 650°C." The claimed temperature range for a dry treatment is enabled by this disclosure, because the claimed range falls within the quoted range.

Furthermore, Example IV and Figure 6 disclose a dry mix heat treatment temperature of 600°C producing an improvement in capacity fade compared to control batteries. This disclosure enables any person skilled in the art to practice the dry mix process within the temperature range of 250 and 450°C and obtain the claimed batteries with improved capacity fade rate. Therefore, this rejection is respectfully traversed.

Claims 1, 3-5, 7-12, 27, and 29-37, are rejected under 35 U.S.C. §102(b)/103 (a) as allegedly being anticipated by, and alternatively unpatentable over, Uehara et al., JP 09-330720. This rejection is respectfully traversed.

Independent claims 1 and 27 and dependent claims 4 and 30 have been amended to more particularly point out and distinctly claim the invention of the present application, and to further distinguish the invention over the disclosure of Uehara et al. Claims 1 and 27 have been amended to limit the anode to a lithium compound anode. Lithium borate in claims 1 and 27, has also been limited to a lithium borate hydrate, an aqueous lithium borate solution, or an aqueous lithium borate hydrate solution. The claims which depend from independent claims 1 and 27 also include these limitations.

The rejection in view of Uehara et al. is respectfully traversed because the preparation of the cathode in the battery of the present invention provides unexpected results in view of Uehara et al. Uehara et al. is limited to a heating temperature of 650°C for the mixture of the cathode powder and the lithium boron nitride compound. In view of this disclosure in Uehara et al., one of skill in the art would not expect the lithium boron/lithium insertion compound cathode heated at only a maximum of 450°C in the present application to provide a battery having a reduced capacity fade rate during cycling. Uehara discloses no range of temperatures for this heating process. In fact, Uehara consistently designates 650°C throughout the examples.

Further, in view of Uehara, one of skill in the art would not expect a lithium borate hydrate to produce a suitable cathode for a battery having reduced capacity fade rate during cycling. Uehara never mentions a lithium borate hydrate.

The claims of the present application have been limited to include a dry-mix treatment with lithium borate hydrate and, alternatively, aqueous treatments with lithium borate, which are discussed in the attached Declaration of Dr. Ulrich von Sacken. The Examiner requested a comparison of the improvement in capacity fade rate for the battery of the present invention with the battery disclosed by Uehara. However, as discussed in the Declaration, too many

differences exist to make a valid comparison of this type. Even so, as shown in Figure 5 and discussed in Paragraph 4 of Dr. von Sacken's Declaration, when applied to the test cells of the present invention, the Uehara et al. treatment method worsened rather than improved capacity fade rate. Therefore, because the treatment method used in the present invention provides unexpected results in view of Uehara et al. this rejection is traversed.

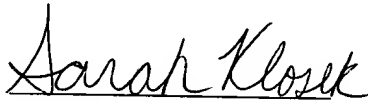
Additionally, the claims are also not obvious in view of Uehara et al. As shown in Figure 5, heat treatment at the 650°C temperature disclosed by Uehara et al. produces an undesirable increase in capacity fade rate in comparison to an untreated control. When the presently-claimed 250 to 450°C temperature range is employed, a dramatic improvement in capacity fade rate is obtained, both over the untreated control and a sample prepared by the treatment method disclosed by Uehara et al. In view of the results depicted in Figure 5, Claims 1 and 27, as well as claims 3-5, 7-12 and 29-37 depending therefrom, patently define over Uehara et al. under 35 U.S.C. §103(a). Reconsideration by the Examiner and withdrawal of this rejection is therefore respectfully requested.

The Examiner also rejected claims 13 and 38 under 35 U.S.C. §103(a) as being unpatentable over Uehara et al. in view of Gosho et al., U.S. Patent No. 6,589,694. The Examiner acknowledges that Uehara et al. did not teach the electrolyte solvent of claims 13 and 38, but cited Gosho et al. as teaching this limitation. This rejection is respectfully traversed for the reasons set forth hereinafter.

Claims 13 and 38 depend from claims 1 and 27, respectively, and are directed to allowable subject matter of claims 1 and 27 for the reasons discussed above. The combination of Uehara et al. and Gosho et al. does not render claims 13 and 38 obvious because both references use a heating temperature of 650°C or higher. Because the use of lower heating temperatures produces a cathode active material with decreased capacity fade rate in comparison to the prior art temperatures employed, claims 13 and 38 are patentable over the cited combination of Uehara et al. in view of Gosho et al. under 35 U.S.C. §103(a). Reconsideration by the Examiner and withdrawal of this rejection is therefore respectfully requested.

In view of the above claim amendments and remarks, it is believed that this application is now in condition for allowance. Reconsideration is respectfully requested. The Examiner is invited to telephone the undersigned if there are any remaining issues in this application to be resolved. Finally, if there are any additional charges in connection with this response, the Examiner is authorized to charge applicants' Deposit Account No. 19-5425 therefor.

Respectfully submitted,

A handwritten signature in cursive script, reading "Sarah Klosek".

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